LISTING OF THE CLAIMS

This listing of the claims replaces all prior versions, and listings of the claims in the application:

1. (Previously Presented) A method for measuring cardiac output comprising:

(1) measuring a first parameter indicative of a patient's oxygen uptake and a second parameter indicative of such a patient's fractional arterial oxygen concentration;

(2) inducing a change in such a patient's arterial oxygen concentration;

(3) repeating the first parameter and the second parameter measurements set forth in step (1); and

(4) determining an estimate of the patient's cardiac output based on the first parameter and the second parameter information collected in steps (1) and (3).

2. (Original) The method according to claim 1, wherein the second parameter indicative of fractional arterial oxygen concentration is one of SaO_2, PaO_2, CaO_2 or SpO_2.

3. (Previously Presented The method according to claim 1, wherein measuring the first parameter includes providing a flow sensor operatively coupled to such a patient's airway, wherein the flow sensor outputs a flow signal indicative of a flow of breathing to or from such a patient.

4. (Previously Presented) The method according to claim 1, wherein measuring the first parameter includes providing an oxygen analyzing element operatively coupled to such a patient's airway, wherein the oxygen analyzing element outputs an oxygen concentration signal indicative of an amount of oxygen in gas passing through the oxygen sensor.

5. (Previously Presented) The method according to claim 1, wherein measuring the second parameter includes providing a pulse oximeter sensor in contact with such a patient,

wherein the pulse oximeter sensor outputs a signal indicative of an oxygen saturation SpO_2 of such a patient.

6. (Previously Presented) The method according to claim 1, wherein inducing a change in such a patient's arterial oxygen concentration includes introducing a non-oxygen breathing gas into a stream of gas to be inhaled by such a patient or introducing oxygen into the stream of gas to be inhaled by such a patient.

7. (Original) The method according to claim 1, wherein inducing a change in such a patient's arterial oxygen concentration includes rebreathing gas exhaled by such a patient.

8. (Original) The method according to claim 7, wherein rebreathing includes removing carbon dioxide CO_2 from the exhaled gas before the exhaled gas is rebreathed.

9. (Previously Presented) The method according to claim 1, wherein determining an estimate of the patient's cardiac output includes:

determining a deviation of such a patient's oxygen uptake from a baseline oxygen uptake level occurring responsive to the induced change in such a patient's arterial oxygen concentration in step (2);

determining a deviation of such a patient's arterial oxygen concentration from a baseline arterial oxygen concentration level occurring responsive to the induced change in such a patient's arterial oxygen concentration in step (2); and

comparing the deviation in oxygen uptake to the deviation in arterial oxygen concentration.

10. (Original) The method according to claim 9, wherein determining the deviation of such a patient's oxygen uptake includes determining an effective area between the baseline oxygen uptake level and an oxygen uptake curve occurring responsive to the execution

of step (2), and wherein determining the deviation of such a patient's arterial oxygen concentration includes determining an effective area between the baseline arterial oxygen concentration level and an arterial oxygen concentration curve occurring responsive to the execution of step (2).

11. (Original) The method according to claim 9, wherein determining the deviation of such a patient's oxygen uptake includes determining a slope of a line extending between the baseline oxygen uptake level and a point on an oxygen uptake curve occurring responsive to the execution of step (2), and wherein determining the deviation of such a patient's arterial oxygen concentration includes determining a slope of a line extending between the baseline arterial oxygen concentration level and a point on an arterial oxygen concentration curve occurring responsive to the execution of step (2).

12. (Original) The method according to claim 9, wherein determining the deviation of such a patient's oxygen uptake includes determining a magnitude between the baseline oxygen uptake level and a point on an oxygen uptake curve occurring responsive to the execution of step (2), and wherein determining the deviation of such a patient's arterial oxygen concentration includes determining a magnitude between the baseline arterial oxygen concentration level and a point on an arterial oxygen concentration curve occurring responsive to the execution of step (2).

13. (Original) The method according to claim 1, further comprising outputting, in human perceivable form, an indication of the cardiac output determined in step (4).

14. (Previously Presented) An apparatus for measuring cardiac output comprising:

means for measuring a first parameter indicative of a patient's oxygen uptake;

means for measuring a second parameter indicative of such a patient's fractional arterial oxygen concentration;

means for inducing a change in such a patient's arterial oxygen concentration;

a processor adapted to determine an estimate of such a patient's cardiac output based on the output of the first parameter and the second parameter; and

outputting means for outputting a result indicative of such a patient's cardiac output.

15. (Original) The apparatus according to claim 14, wherein the means for measuring the second parameter is a pulse oximetry system including a pulse oximeter sensor in contact with such a patient.

16. (Original) The apparatus according to claim 14, wherein the second parameter indicative of fractional arterial oxygen concentration is one of SaO_2, PaO_2, CaO_2 or SpO_2.

17. (Previously Presented) The apparatus according to claim 14, wherein the patient flow measuring system includes a flow sensor operatively coupled to such a patient's airway such that gas inhaled and exhaled by the patient passes through the flow sensor.

18. (Previously Presented) The apparatus according to claim 14, wherein the oxygen analyzing system includes an oxygen analyzing element comprising (a) an airway adapter having an optical window and (b) an oxygen transducer having an photoemitter and a photodetector, and wherein the oxygen analyzing element is disposed proximate to such a

patient's airway such that gas inhaled and exhaled by such a patient passes in front of the optical window.

19. (Previously Presented) The apparatus according to claim 14, wherein the means for inducing a change in such a patient's arterial oxygen concentration comprises a system for introducing a non-oxygen breathing gas into a stream of gas to be inhaled by such a patient or a system for introducing oxygen into the stream of gas to be inhaled by such a patient.

20. (Original) The apparatus according to claim 14, wherein the means for inducing a change in such a patient's arterial oxygen concentration comprises a rebreathing system for causing such a patient to rebreathe gas exhaled by such a patient.

21. (Original) The apparatus according to claim 20, wherein the rebreathing system further comprises means for removing carbon dioxide CO_2 from the exhaled gas before the exhaled gas is rebreathed.

22. (Previously Presented) The apparatus according to claim 14, wherein the processor determines:

(a) a deviation of such a patient's oxygen uptake from a baseline oxygen uptake level occurring responsive to an induced a change in such a patient's arterial oxygen concentration;

(b) a deviation of such a patient's arterial oxygen concentration from a baseline arterial oxygen concentration level occurring responsive to an induced a change in such a patient's arterial oxygen concentration; and

(c) a comparison of the deviation in oxygen uptake to the deviation in arterial oxygen concentration.

23. (Original) The apparatus according to claim 22, wherein the processor determines the deviation of such a patient's oxygen uptake by determining an effective area between the baseline oxygen uptake level and an oxygen uptake curve occurring responsive to the induced change in such a patient's arterial oxygen concentration, and determines a deviation of such a patient's arterial oxygen concentration by determining an effective area between the baseline arterial oxygen concentration level and an arterial oxygen concentration curve occurring responsive to the induced change in such a patient's arterial oxygen concentration.

24. (Original) The apparatus according to claim 22, wherein the processor determines the deviation of such a patient's oxygen uptake by determining a slope of a line extending between the baseline oxygen uptake level and a point on an oxygen uptake curve occurring responsive to the induced change in such a patient's arterial oxygen concentration, and determines the deviation of such a patient's arterial oxygen concentration by determining a slope of a line extending between the baseline arterial oxygen concentration level and a point on an arterial oxygen concentration curve occurring responsive to the induced change in such a patient's arterial oxygen concentration.

25. (Original) The apparatus according to claim 22, wherein the processor determines the deviation of such a patient's oxygen uptake by determining a magnitude between the baseline oxygen uptake level and a point on an oxygen uptake curve occurring responsive to the induced change in such a patient's arterial oxygen concentration, and determines the deviation of such a patient's arterial oxygen concentration by determining a magnitude between the baseline arterial oxygen concentration level and a point on an arterial oxygen concentration curve occurring responsive to the induced change in such a patient's arterial oxygen concentration.